DOCUMENT RESUME

ED 421 126 IR 018 845

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TITLE Principal Leadership for Successful School Technology Implementation.
PUB DATE 1998-00-00
NOTE 7p.; In: "SITE 98: Society for Information Technology & Teacher Education International Conference (9th, Washington, DC, March 10-14, 1998). Proceedings"; see IR 018 794.
PUB TYPE Reports - Research (143) -- Speeches/Meeting Papers (150)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Administrator Attitudes; *Administrator Role; Assistant Principals; Educational Change; Educational Development; *Educational Technology; Elementary Secondary Education; *Instructional Leadership; *Principals; School Administration; School Surveys; Staff Development
IDENTIFIERS Administrator Surveys; *Barriers to Implementation; *Technology Integration

ABSTRACT

This study examined technology implementation in the classroom and the principal's perception of what the inhibitors are to technology integration. Surveys were distributed to 112 school administrators--both principals and assistant principals--in a school district in southeast Texas. Sixty-four (57.14%) were returned. Results indicate that principals and assistant principals view technology as very important in their schools and that it is significantly important for teachers to learn technology as a curriculum tool. The study also shows that the main inhibitors to implementing technology in the classroom are lack of financial resources for hardware, software, and infrastructure, and lack of time for professional development and planning. It is concluded that principals and other school leaders must accept the challenge to create supportive conditions which will foster innovative uses of computers. There needs to be closer alignment between the amount of time for professional development with technology and its degree of perceived importance. At each level, funding, training, and leadership issues must be addressed simultaneously if technology in the curriculum is to grow and have an impact on the reform of public education. (Contains 31 references.) (AEF)

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PRINCIPAL LEADERSHIP FOR SUCCESSFUL SCHOOL TECHNOLOGY IMPLEMENTATION

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There is no shortage in the current education literature about the need to reform our public schools (Sarason, 1997; Goodlad, 1997). Educators are being told they are not keeping up with the real world. Business leaders are complaining that schools are not producing enough qualified workers (Matthews, 1997; Wadsworth, 1997). Educators often are told that the schools of the twenty-first century must be organized differently from the schools of the twentieth century to meet the needs of an increasingly diverse society. Many educators recognize the need for a change and there is a strong call for reform (Glickman, 1998; Goodlad, 1997; Schlechty, 1997; Sarason, 1997; Hirsh, 1996; Sergiovanni, 1996; Barth, 1990).

Researchers (Fullan, 1996; Goodlad, 1997; Sergiovanni, 1996) have begun to question whether we are meeting the varied educational needs of all students. Also being questioned is the structure of schools and whether these structures are appropriate for educational institutions. Each has suggested that there are major changes that need to occur in schools if we are to meet the needs of students now and in the future. Fullan (1996) suggests that rather than think in terms of reforming schools, we need to think in terms of reculturing schools. He suggests that the values, beliefs, and norms of schools need to be examined to determine whether the existing culture of the school is preparing students for participation in a complex society that requires strong problem-solving abilities. To reform our present system, principals must change from their present role of manager to instructional leader. The key role principals play in schools is well documented and acknowledged (Buckner, 1997).

As Szabo & Schwarz (1997) point out, instructional technology has great but unrealized potential for reforming educational systems. Proponents of educational technology advocate using technology to fundamentally restructure education: the business of how teachers teach and how students learn (Ellis & Fouts, 1994; Wirth, A.G., 1992). Past explorations of why the potential is unrealized have focused upon attempts to get people to change and the complexities of instructional use of computers. An important person in making change happen is the school principal.

Instructional Leadership and Technology

A survey of the literature in education points to the critical role of the principal as instructional leader in the school (LaRocque & Oberg, 1991; Henri & Hay, 1995). Pellicer, Anderson, Keefe, and McCleary (1990) state that "...instructional leadership is likely the most important function in a school for creating a productive and satisfying environment" (p. 41). Duresh (1997) makes the observation that because of the emphasis on instructional leadership, preservice programs have focused on learning experiences that help future school administrators "...oversee the teaching-learning activities in their schools as the primary area of attention and responsibility" (p. 5).

Lou Gerstner, (1994) CEO of IBM, claims that nothing matters more to America's schools than finding competent principals to lead them. Although the role of the school principal is frequently cited as the key element in school reform, it is not the solitary role of times past. It is a role that demands skills in enhanced team building, shared decision making, and increased technological competency.

Researchers at the Stanford Research Institute and Educational Development Corporation find that technology can be a powerful tool for supporting educational reform (1992). As many states and communities across the country are learning, transforming industrial age schools into information age schools is easier said than done (Dyrli & Kinnaman, 1994). The key to ensuring the success of technology in schools is the way in which technology is integrated into the school's curriculum. As Kinnaman (1994) observes, successfully integrating technology into education requires basic changes to our current model of schooling; anything less sells short both the value of today's technology and the future of education. School principals must understand the importance of technology for improving school management as well as its implications for improved instruction.

Technology with the right software equipment and instructional design can enhance the students' active

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participation in his/her learning and encourage problem solving skills by involving them in realistic assignments. This transformation from industrial age schools into information age schools won't happen without active leadership by the school principal. If schools are to take full advantage of the educational opportunities available through media centers, principals must be knowledgeable concerning their vast potential. One of these potentials was addressed in the Lance study (1993) which revealed that quality school media centers significantly impact students' test scores.

Inhibitors to Technology Implementation

First, there are teachers and administrators who believe the lack of available money for technology is a problem when trying to integrate technology into the curriculum. Research shows that the amount of money available to a school district is not related to the innovative uses of computers. Exemplary teachers work in a representative range of communities and schools. However, they tend to be found in settings where school and district resources have been used to create supportive conditions (Becker, 1994).

Second, principals need to plan professional development programs for teachers. Professional development is essential for technology implementation in the schools (Solomon, 1995). Plans for professional development need to be cost effective and as non- disruptive as possible (Dwyer, 1995).

There is no scarcity of literature when it comes to professional development or topics related to professional development (Parker, 1994). There is a need whenever change or introduction of something new or unknown to a group of employees to have some training or professional development. For school administrators professional development is one of their major responsibilities. Research shows that a factor in creating trust between teachers and their principals involves principals being involved in teachers' professional development (MacNeil & Blake, 1998). Research also shows that teachers' job satisfaction is related to how principals' instructional management focuses on teachers' professional development (MacNeil, 1992).

Principals need to solve the dilemma of how to provide appropriate technology training for all the faculty. Dyrli (1996) recommends a number of key elements for a successful staff development, including: offering a variety of options, emphasizing skill development, providing hands-on experiences, tailoring programs to local realities, using genuine teaching examples, and providing supporting materials. Principals need to be aware that if the teachers are not the focus of the technology training, then technology will fail (Guhlin, 1996). Teachers have to feel involved in the process of integrating technology into the curriculum. This involvement will ensure that the teachers take personal ownership for this responsibility. Once personal ownership has been established, it is easier for the teachers to work toward goals, because they now have more purpose and meaning. The main thing to remember is whatever training the teachers have, it is crucial that it applies to them as professionals as well as individuals.

Third, principals must be prepared to deal with teacher resistance to technology being integrated into the curriculum. Many teachers perceive technology as another burden of responsibility added to the already overwhelming load of a teacher (Hartzell, 1996). Another area of resistance happens "...because teachers believe that interpersonal relations are essential in student learning, the use of technologies that either displace, interrupt or minimize that relationship between the teacher and the child is viewed in a negative light" (Cuban, 1986, p. 61). Principals have to be prepared to provide extensive teacher training in the integration of technology into the curriculum (Weiss, 1994). Principals need to create an environment conducive to maximizing technology integration into the curriculum. A faculty that becomes comfortable with the ideas of technology will more easily integrate it into the curriculum.

Methodology

A survey technique was used to gather data. Specific items were developed for the categories of implementing technology into the classroom and the principal's perception of what are the inhibitors to integrating technology in the schools' curriculum. All 112 school administrators, both principals and assistant principals in a school district in southeast Texas were given the survey. 64 or 57.14% of the surveys were returned. Specifically they were asked: How important is technology in your school? How important is staff development for your teachers to learn technology as a curriculum tool? Estimate the percentage of staff development time this year your teachers will use to train on any type of technology? And, what is/are the major inhibitor/s to integrating technology in the classroom? The data were treated by using SPSS to determine frequencies and descriptive statistics to analyses the responses to the questions: How important is technology in your school? How important is staff development for your teachers to learn technology as a curriculum tool?"

Respondents were also given the opportunity to add open-ended responses to the following questions: What is/ are the major inhibitor/s to integrating technology in the classroom? Estimate the percent of staff development time this year your teachers will use to train on any type of technology. A frequency table was used to show the results of their answers as well a histogram to show the responses for the amount of time designated for professional development. A pie chart is used to show the responses to the inhibitors to integrating technology in the classroom curriculum.

Findings

In answering the first question, "How important is technology in your school?" the principals reported

technology to be very important (See Table 1 and Figure 1). 67.2% of the respondents answered that technology is very important and 90.6% rated it a 4 or 5 in importance.

Table 1
Importance of technology: 5 represents most important 1 represents not important

Value Label	Value Frequency	Percent	Valid Percent	Cum Percent
2	1	1.6	1.6	1.6
3	5	7.8	7.8	9.4
4	15	23.4	23.4	32.8
5	43	67.2	67.2	100.0
Total	64	100.0	100.0	

Valid cases - 64, Missing cases - 0

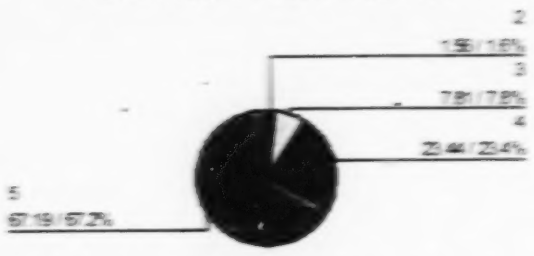

Figure 1. Ratings for the importance of technology
5 = most important, 1 = not important

Principals rated the importance of the teachers learning technology as a curriculum tool also very high. (See Table 2 and Figure 2). 60.9% of the respondents answered that staff development to learn technology as a curriculum tool is very important and 89.0% rated it a 4 or 5 in importance.

Table 2.
Importance for your teachers to learn technology as a curriculum tool

ValueValue Label	Percent Frequency	Valid	Cum Percent	Percent
2	1	1.6	1.6	1.6
3	6	9.4	9.4	10.9
4	18	28.1	28.1	39.1
5	39	60.9	60.9	100.0
Total	64	100.0	100.0	

Valid cases - 64, Missing cases - 0

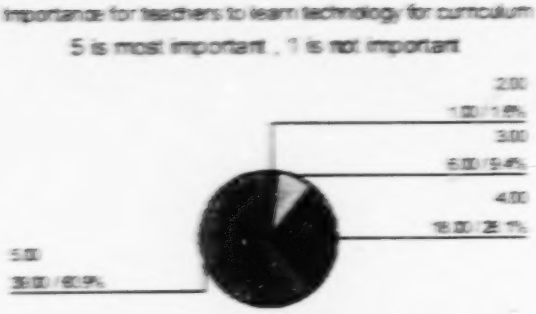

Figure 2. Importance for teachers to learn technology for curriculum
5 = most important, 1 = not important

In answer to the question, "Estimate the percentage of staff development time this year your teachers will use to train on any type of technology" the principals' response was inconsistent with the amount of importance they attached to technology and its implementation as a curriculum tool (See Table 3 and Figure 3). 65.2% of the respondents indicated that 25% or less of the total annual staff development time would be allocated for training to use technology in the curriculum. The histogram visually demonstrates the amount of staff development time principals estimated.

Table 3.
Estimated percentage of time for staff development using technology.

Value Label	Value Frequency	Percent	Valid Percent	Cum Percent
00	3	4.7	4.9	4.9
1	1	1.6	1.6	6.6
5	3	4.7	4.9	11.5
10	16	25	26.2	37.7
12	1	1.6	1.6	39.3
15	3	4.7	4.9	44.3
20	11	17.2	18	62.3
25	14	21.9	23	85.2
30	4	6.3	6.6	91.8
35	1	1.6	1.6	93.4
40	1	1.6	1.6	95.1
50	2	3.1	3.3	98.4
100	1	1.5	1.6	100

Valid cases 61 Missing cases 3

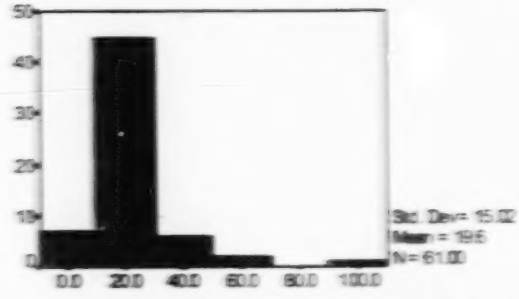

Figure 3. Histogram showing estimated time for annual staff development with technology.

Conclusion

Principals and assistant principals in the southeast school district in the state of Texas answered that technology is very important in their schools and that it is significantly important for teachers to learn technology as a curriculum tool. This study also shows that the main inhibitors to implementing technology in the classroom are: 1) lack of financial resources for hardware, software, and infrastructure, and 2) lack of time for professional development and planning. Teacher resistance was not shown to be a high inhibitor perhaps because technology is become more common to the classroom.

Principals and other school leaders must accept the challenge to create supportive conditions which would foster innovative uses of computers. There needs to be closer alignment between the amount of time for professional development with technology and its degree of perceived importance. As one prepares the faculty in the professional development plan for integrating technology into the curriculum, higher level support must be given so that school faculty have access to computers during instruction time and planning time.

Recommendations

Technology is the means to increasing learning efficiency. Technology can be used to better display information, increase access to information, improve information sharing, and organize better class presentations. Technology is not a panacea for educational problems, but by combining technology with applicable learning models, the overall quality of education is enhanced. Students raised in an age of technology demand student-centered and led learning. Educators must discover and develop how to implement new technologies into the learning environments and focus efforts on facilitating learning (Adams & Jansen, 1997).

At each level, the funding, training, and leadership issues must be addressed simultaneously if technology in the curriculum is to grow and have an impact on the reform of public education. Principals must use their existing resources wisely and creatively. They must think "outside the box,"; they must think in a fluid environment.

Additionally, state legislatures, corporate businesses, the federal government, and, local school boards must continue to look critically at their priorities. Elected officials must continue (or begin) efforts to "re-tool" education for the next century. Principals and teachers are, for the most part, ready. They must have the resources to proceed.

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